REMARKS

The Office Action dated October 20, 2003, has been carefully reviewed and the foregoing amendment has been made in response thereto. Claims 1-24 are pending in the application.

The present invention relates to a performance monitoring system for motor vehicles and the like utilizing a combination of on-board data collection, modest on-board computational capabilities (i.e., moderate memory and processing), a comprehensive computation center for computationally intensive data classification and decision making, and moderate bandwidth two-way communications between the vehicle and the computation center. A lower level of computational capability is sufficient on the vehicle since the purpose for recognizing potential fault conditions is to automatically send buffered data signals to the remote computation center where more rigorous pattern matching or other data classification can be performed. By automatically transmitting the buffered data signals in response to a trigger event, corrective or restorative actions can be initiated without requiring the vehicle to first visit a maintenance facility.

The rejection of claims 1-9, 11-13, 15-18, and 20-23 under 35 USC 102(b) as being anticipated by Coiner et al is respectfully traversed. Claim 1 recites, in part, an analyzer responsive to the electrical signals for performing data analysis and calculating predetermined parameters to detect a trigger event indicative of at least a potential variance of an operational component from its nominal operating state, a computation center located remotely from the apparatus (e.g., vehicle) and having a database storing representations of electrical signals for classifying nominal and irregular operating states of the operational components, a transmitter activated by the trigger event to automatically transmit at least some of the stored samples in the rolling buffer at the time of the trigger event to the computation center, wherein the computation center receives the transmitted samples and classifies them according to the nominal or irregular operating states.

Coiner et al fails to either teach or suggest the claimed invention. For example, Coiner et al has no teaching that its recorded data is automatically transmitted to a computation center. Coiner et al discloses the "freezing" of data records in a memory when sampled signals have a value exceeding a threshold (e.g., Figure 5). Stored data in Coiner et al may be transferred to another computer for storage and analysis. As stated in column 3, lines 16-19, direct wire or wireless communication can be employed to download the data to a portable computer. Thus, there is no teaching or suggestion of automatic transfer of data in order to provide in real time the data to a computation center for classifying the data samples according to the nominal or irregular operating states of the operational components.

Coiner et al is further deficient as being anticipatory of claim 1 because Coiner et al fails to teach or suggest an analyzer for detecting trigger events in response to performing data analysis and calculating predetermined parameters. As opposed to being merely a data capturing device like Coiner et al, the present invention utilizes a synergistic combination of on-board (e.g., on-vehicle) computing and off-board computing resulting in efficient use of both processing resources and the available bandwidth for communication between the on-board and off-board resources. Thus, Coiner et al fails to teach or suggest the invention recited in claim 1.

Claim 4 recites that in response to the electrical signals that are sampled, one of a plurality of subsets of the electrical signals is transmitted by the transmitter. Thus, when a particular operating state in present, the transmitted samples are adjusted so that they are more relevant diagnostically. Coiner et al lacks any teaching or suggestion of such an adjustment of transmitted samples. Claim 5 recites that the predetermined subset is chosen in response to a control signal from the computation center. Coiner et al lacks any teaching or suggestion of choosing a subset of signals in response to a control signal from a computation center. Claims 8 and 9 recite that the transmitted samples correspond to a first predetermined subset prior to a trigger event and a second predetermined subset after the trigger event. Coiner et al lacks any ability to alter the data signals being gathered in response to a trigger event.

Claim 15 recites that a trigger event is comprised of the detection of the setting of a diagnostic code in a microcontroller. Coiner et al fails to teach or suggest any diagnostic codes generated in a microcontroller. As shown at column 2, lines 38-43, Coiner et al collects and records sensor data. There is no teaching of the collection or recording of diagnostic trouble codes. Coiner et al does not utilize any computational capability in the monitored devices themselves for detecting a trigger event.

Claims 17 recites comparison of stored samples with a predetermined pattern, and claim 18 recites that the predetermined pattern is a histogram. Coiner et al has only the capability to compare the magnitude of sampled data with a threshold or to detect the value of two-state data. It lacks any capability to perform pattern matching or the evaluation of a histogram.

Claim 21 recites that an analysis routine for detecting a trigger event is downloaded from the computation center via the transceiver. Coiner et al lacks any teaching or suggestion of the computation center. Furthermore, the only download of which Coiner et al is capable is the download of data from the vehicle.

Claim 23 recites an operator interface for displaying messages from the computation center in response to a classification of transmitted samples. Coiner at al discloses only a display at the remote computation device that performs an analysis of data, and not any message display for the vehicle operator. Furthermore, Coiner et al fails to disclose any messages that are in response to a classification of the samples (e.g., a message that particular maintenance actions are needed).

Thus, claims 1-9, 11-13, 15-18, and 20-23 are patentable over Coiner et al.

The rejection of claim 19 under 35 USC 103(a) as being unpatentable over Coiner et al in view of McGrath et al is respectfully traversed. Coiner et al fails to teach or suggest the system as noted above. McGrath fails to either correct for the deficiencies of Coiner et al or to provide any teaching or suggestion of averaging as recited in claim 19. Therefore, claim 19 is allowable over the cited references.

The rejection of claims 10 and 24 under 35 USC 103(a) as being unpatentable over Coiner et al in view of Fiechter et al is respectfully traversed.

Fiechter et al fails to correct for the deficiencies noted above in Coiner et al. Therefore, claims 10 and 24 are allowable over the cited references.

The rejection of claim 14 under 35 USC 103(a) as being unpatentable over Coiner et al in view of Bastian et al is respectfully traversed. Bastian et al fails to correct for the deficiencies noted above in Coiner et al. Furthermore, there is no suggestion in the references supporting their combination. The rejection merely notes that such a combination is desirable without showing any motivation in the references themselves that leads to such a combination. Therefore, claim 14 is allowable over the cited references.

In view of the foregoing amendment and remarks, claims 1-24 are in condition for allowance. Favorable action is respectfully solicited.

Respectfully submitted,

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